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|---|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2629 | |

DATE MAILED: 05/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/705,515 | BOLDT ET AL. | |
| | Examiner | Art Unit | |
| | Prabodh M. Dharia | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Priority***

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has complied with one or more conditions for receiving the benefit of an earlier filing date under, 35 U.S.C. [1]. A reference to the prior application has been inserted as the first sentence(s) of the specification of this application and the reference includes the relationship (i.e., continuation, divisional, or **continuation-in-part**) of all nonprovisional applications.

***Claim Objections***

2. Claim8 objected to because of the following informalities: page 14, Claim 8 Lin 3, after word " transmitted" the word "wavefront " should be "waveform". Appropriate correction is required.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura et al. (4,842,396) in view of Swanson et al. (5,889,567).

Regarding Claim 1, Minoura et al teaches a video display apparatus (Col. 4, Lines 54-59, figure 21 and 22, Col. 14, Line 29 to Col. 15, Line 9, Col. 16, Lines 50-68, figure 25 and 26,

figure 11, Col. 9, Lines 11-18, figure 17, Col. 12, Lines 23-49) for directing light in an X, Y, Z coordinate system wherein the X and Y axis form the XY plane that contains the cross section of the dispersed light pattern (figure 21 and 22, Col. 14, Line 61 to Col. 15, Line 9) and the Z axis is in the direction of the propagation of light (Col. 16, Lines 64-68) and is through the center of the light pattern in the XY plane (figure 25 and 26, Col. 16, Lines 50-60) and c. a diffractive optical element (figure 11, Col. 9, Lines 11-18) mounted on the housing in front of the pixel, the diffractive optical element being arranged to receive the light emitted by the pixels (figure 17, Col. 12, Lines 23-49) and disperses the light in a pattern such that the dispersed light is centered along the Z axis (Col. 16, Lines 64-68) and the pattern is greater along the X axis than along the Y axis (figure 3, Col. 14, Lines 29-42)

However, Minoura et al fails to teach display apparatus comprising: a. a housing; b. a plurality of pixels mounted in the housing, each pixel having a plurality of light emitting diodes and each light emitting diode arranged to emit light outwardly from the housing.

However, Swanson et al. teaches display apparatus comprising: a. a housing (Col. 3, Lines 18-20); b. a plurality of pixels mounted in the housing (Col.3, Lines 7-10), each pixel having a plurality of light emitting diodes and each light emitting diode arranged to emit light outwardly from the housing (figures 1,2, Col. 5, Line 47 to Col. 6, Line 3); c. a diffractive optical element (figure 11, Col. 9, Lines 11-18) mounted on the housing in front of the pixel, the diffractive optical element being arranged to receive the light emitted by the pixels (Col. 3, Lines 14-20).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Swanson et al. teaching in teaching of Minoura et al. for improving efficiency of the Imaging Display system.

Regarding Claim 2, Minoura et al. teaches the housing defines a planar surface, the LEDs array being arranged (Col. 8, Lines 8-15, Lines 28-42) substantially in a plane parallel to the housing surface with the Z axis being perpendicular to the housing surface (figure 25, Col. 16, Lines 50-68).

Regarding Claim 3, Minoura et al. teaches a mask, the mask securedly fixed (Col. 16, Lines 58-64), to the housing such that the a diffractive optical element (figure 11, Col. 9, Lines 11-18, figure 15B, Col. 12, Lines 16-21) is between the housing and the mask (Col. 16, Line 58 to Col. 17, Line 8).

Regarding Claim 4, Minoura et al. teaches the housing defines a substantially planer surface and wherein the a diffractive optical element (figure 11, Col. 9, Lines 11-18) redirects the transmitted light such that an angle greater than 3 degrees exists between the 2 axis a angle perpendicular to the surface of the housing (Col. 11, Lines 34–68).

Regarding Claim 5, Minoura et al. teaches the housing defines a substantially planar surface and further comprising a reflector for each light emitting diode for directing additional

light in substantially an outward direction perpendicular to the surface of the housing (Col. 8, Lines 8-15, Lines 28-42).

Regarding Claim 6,10, Minoura et al. fails to teach each pixel has at least one light emitting diode for emitting green light, at least one light emitting diode for emitting blue light and at least one light emitting diode for emitting red light.

Swanson et al. teaches each pixel has at least one light emitting diode for emitting green light, at least one light emitting diode for emitting blue light and at least one light emitting diode for emitting red light (Col. 5, Lines 52-56) and the diffractive optical element acts as a diffuser (Col. 16, Lines 54,63,54, Col. 17, Lines 6-13, diffuse reflective box outputs lights to LCD- a diffractive property of optical element).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Swanson et al. teaching of multicolor LEDs and diffractive element as a diffuser in teaching of Minoura et al. for improving efficiency of the Imaging Display system.

5. Claims 7,9,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura et al. (4,842,396) in view of Swanson et al. (5,889,567) as applied to claims 1-6,10 above, and further in view of Russell (5,926,411).

Regarding Claim 7,9, 12, Minoura et al. modified by Swanson et al. teaches display apparatus (Col. 4, Lines 54-59).

However, Minoura et al. modified by Swanson et al. fails to teach a plurality of video image modules can be combined to form a video image board

However, Russell teaches a plurality of video image modules can be combined to form a video image board (Col. 43, Lines 10-24, Col. 2, Lines 42-47); the diffractive optical element can be interchanged with other diffractive optical elements providing a variety of forms of transmitted light (figure 66A, Col. 44, Lines 50-64) and the diffractive optical element is a surface relief holograph (Col. 3, Lines 27-32).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Russell teaching of combined video modules with diffractive elements and their properties in teaching of Minoura et al. modified by Swanson et al. for selectively and sequentially illuminating different data patterns on common photo-sensors array image plane.

6. Claims 8,13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura et al. (4,842,396) in view of Swanson et al. (5,889,567) as applied to claims 1-6,10 above, and further in view of Waldern et al. (US 2004/0108971 A1).

Regarding Claims 8, 13-16, Swanson et al. teaches the diffractive optical element is selected from the group having holographic, kinoform, binary multilayer and continuous (grey scale) faces which rely on diffraction to control the transmitted waveform (Col. 6, Lines 4-49, Col. 16, Lines 54,63,54, Col. 17, Lines 6-13, diffuse reflective box outputs lights to LCD- a diffractive property of optical element, (spherical reflector outputting incident light) Col. 24, Lines 7-16, (grey scale), Col. 14, Lines 30-41).

However, Minoura et al. modified by Swanson et al. fails to recite specifically the diffractive optical element is selected from the group having holographic, kinoform, binary multilayer and continuous (grey scale) faces which rely on diffraction to control the transmitted waveform.

However, Waldern et al. teaches the diffractive optical element is selected from the group having holographic, kinoform (page 2, paragraphs 46,47, page 7, paragraph 12), binary (page 10, paragraph 132) multilayer (page 2, paragraph 46, Lines 12-15, paragraph 47) and continuous (grey scale) faces (page 7, paragraph 12) which rely on diffraction (page 9, paragraph 126) to control the transmitted waveform (page 6, paragraphs 95,96).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Waldern et al. teaching of multilayer devices with diffractive elements and their properties in teaching of Minoura et al. modified by Swanson et al. to be able to view projecxted images using refractive and reflective optical elements.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura et al. (4,842,396) in view of Swanson et al. (5,889,567) as applied to claims 1-6,10 above, and further in view of Herbert (6,008,939).

Regarding Claim 11, Swanson et al. teaches the diffractive optical element acts as a homogenizer (spherical reflector outputting incident light) (Col. 24, Lines 7-16).

However, Minoura et al. modified by Swanson et al. fails to recite specifically the diffractive optical element acts as a homogenizer.

However, Herbert teaches the diffractive optical element acts as a homogenizer (Col. 6, Line 66 to Col. 7, Line 5).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Herbert teaching of diffractive optical element acts as a homogenizer in teaching of Minoura et al. modified by Swanson et al. for selectively and sequentially the color LEDS switched in any manner compatible with an appropriately fast display minimizing visual flicker.

8. Claims 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (6,115,152) in view of Russell (5,926,411).

Regarding Claim 17, Popovich et al. teaches a method for characterizing the light output of a video display (Col. 2, Lines 41,42) apparatus having a plurality of pixels (Col. 1, Lines 23,24) consisting of at least one LED (2002 of figure 20a, 20b, Col. 21, Line 32) for each desired color (2002 of figure 20a, 20b, Col. 21, Lines 40,41) comprising: a. supplying power at a selected level individually to the LED or LEDs for each color (Col. 22, Line 64, Lines 46-49) in each pixel; and b. measuring the intensity of the light generated by each LED or LEDs for each color in each pixel (Col. 22, Lines 46-49).

However, Popovich et al. et al. fails to teach the dispersed light is a substantially elliptical pattern.

However, Russell teaches the dispersed light is a substantially elliptical pattern (figure 62, Col. 43, Lines 10-14).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Russell teaching in teaching of Popovich et al. for improving efficiency of the Imaging Display system.

Regarding Claim 18, Popovich et al. teaches the step of controlling the power supplied to the LED or LEDs responsible for each color in each pixel to normalize the light output from the display apparatus (Col. 22, Lines 46-49).

Regarding Claim 19, Popovich et al. teaches the step of supplying power to the individual LED or LEDs responsible for each color in each pixel comprises supplying current at a predetermined voltage for a selected time (Col. 21, Lines 58-63, Col. 22, Lines 46-49).

Regarding Claim 20, Popovich et al. teaches the step of controlling the time that current at the predetermined voltage is supplied to the LED or LEDs responsible for each color in each pixel to normalize the light output from the display apparatus (Col. 21, Lines 58-63, Col. 22, Lines 46-49).

Regarding Claim 21, Popovich et al. teaches a method for characterizing the light output of a video display (Col. 2, Lines 41,42) and a. supplying power at a selected level individually to the LED or LEDs for each color (Col. 22, Line 64, Lines 46-49) in each pixel; and b. measuring the intensity of the light generated by each LED or LEDs for each color in each pixel (Col. 22, Lines 46-49).

However, Popovich et al. fails to teach the steps of: a. determining if the intensity of any color specific LED or LEDs in any pixel is below an acceptable level; and b. removing the video display apparatus and replacing the unacceptable LED or LEDs when any color emitted is below an acceptable level.

However, it is well known to one in ordinary in the skill of art to replace a poorly operating part of an apparatus.

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate "the steps of: a. determining if the intensity of any color specific LED or LEDs in any pixel is below an acceptable level; and b. removing the video display apparatus and replacing the unacceptable LED or LEDs when any color emitted is below an acceptable level" teaching in teaching of Popovich et al. for improving efficiency of the Imaging Display system.

Regarding Claim 22, Popovich et al. teaches a light pattern projecting apparatus comprising: a. a light emitting diode emitting light (2002 of figure 20a, 20b, Col. 21, Line 32) in substantially an outward direction (Col. 2, Lines 41-44); and b. a holographic optical element adapted to receive the light emitted by the light emitting diode and transmitting the light in a substantially elliptical pattern (figure 20a, 20b, Col. 21, Lines28-37, Col. 2, Lines 41-44).

However, Popovich et al. et al. fails to teach the dispersed light is a substantially elliptical pattern.

However, Russell teaches the dispersed light is a substantially elliptical pattern (figure 62, Col. 43, Lines 10-14).

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate Russell teaching in teaching of Popovich et al. for improving efficiency of the Imaging Display system.

Regarding Claim 23, Russel teaches how to fabricate Holographic optical elements (Col. 33, Lines 29-37).

However, Russel fails to teach the horizontal spread is between plus 50 degrees and minus 50 degrees and the vertical spread is between plus 7 degrees to plus 25 degrees and between minus 7 degrees to minus 25 degrees.

However, it is well known to, one in ordinary in the skill of art that by selecting appropriate optical index of Holographic optical elements while it is being manufactured to achieve specific angles of dispersion horizontally and vertically.

Thus it is obvious to one in ordinary in the skill of art at the time of invention was made to incorporate teaching of selecting appropriate optical index of Holographic optical elements to achieve specific angles of dispersion horizontally and vertically in teaching of Russell for improving efficiency of the Imaging Display system.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Liu et al. (6,720,519 B2) System and method of laser drilling..

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prabodh M. Dharia whose telephone number is 571-272-7668. The examiner can normally be reached on M-F 8AM to 5PM.

11. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

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AU2629

May 4, 2006

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